

X-101 301/100 06/10/100

⑨ 日本国特許庁 (JP)

⑩ 特許出願公開

⑫ 公開特許公報 (A)

昭59—38253*

⑪ Int. Cl.³
C 08 L 33/12
// (C 08 L 33/12
33/06)

識別記号

庁内整理番号
7142—4 J

⑬ 公開 昭和59年(1984)3月2日

発明の数 1
審査請求 未請求

(全 6 頁)

⑭ 光拡散性アクリル樹脂成形体

号三菱レイヨン株式会社内

⑮ 特 願 昭57—148877

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⑰ 出 願 昭57(1982)8月27日

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明 細 書

1 発明の名称

光拡散性アクリル樹脂成形体

2 特許請求の範囲

メチルメタクリレート系重合体 / 100重量部
に対し下記の架橋ポリマーを / 1~50重量部配
合した樹脂組成物を成形して得られる光拡散性
アクリル樹脂成形体。

架橋ポリマー:

アルキル基の炭素数が1~4の
アルキルメタクリレート 50~90重量%

アルキル基の炭素数が1~8の
アルキルアクリレート 10~40重量%

芳香族ビニルモノマー 0~20重量%

その他のモノエチレン性不飽和
モノマー 0~20重量%

からなる非架橋性モノマー / 100重量部と架
橋性モノマー a 5~5重量部を溶解混合して
得られる粒子径 / 10~500μ、ゲル含有量
50~90重量%、膨潤度3~3.5なる架橋

ポリマー。

3 発明の詳細な説明

本発明は高い光拡散性を有すると同時に高い
光線透過率をも兼ね備えた照明カバー等に適用
した光拡散性アクリル樹脂成形体に関する。

従来アクリル樹脂成形体に光拡散効果を与え
る方法としては基材樹脂に炭酸バリウム、酸化
チタン、タルク等の無機化合物の微粒子を分散
させるか、あるいは型模様のあるダイスで押出
すか、エンボスロールを通すなどの機械的手法
で凹凸模様を付与する方法が一般的であつた。

しかしながら型模様のあるダイスやエンボス
ロールを用いる方法ではある程度光拡散効果の
ある成形体は得られても、照明カバー等の用途
に応じた各種形状に二次加工した場合、表面の
凹凸が失なわれて十分な光拡散効果を示す、成
形体が得られないという重大な欠点があつた。

また、無機化合物の微粒子を基材樹脂に添加
した場合には一般に十分な光拡散性は得られて
も光線透過率の低下が大きいという欠点があり、

芳香族ビニルモノマーとしてはスチレン、 α -メチルスチレン、ビニルトルエン、ハロゲン化スチレン等を用いることが可能であり、その使用量は0~20重量%、好ましくは3~15重量%である。芳香族ビニルモノマーを20重量%を超えて用いると光透過率等の低下をまねくので好ましくない。架橋ポリマーの屈折率調整、架橋度のコントロールなどの点からは20重量%を超えない範囲で用いた方がよい結果が得られる場合が多い。

その他のモノエチレン性不飽和モノマーは特に用いる必要はないが、20重量%を超えない範囲で用いることは可能である。具体例としてはフマル酸、マレイン酸および共重合可能なカルボン酸とそのエステル類、アクリル酸、メタアクリル酸、アクリロニトリル、ハロゲン化ビニル、およびビニルエステル類等が使用可能である。

架橋性モノマーとしては、分子内に2個以上の不飽和結合を持つ化合物が用いられるが、特

にその2個以上の不飽和結合のうちの少なくとも1個がアリル基である様な化合物であることが好ましい。このようなアリル基含有架橋モノマーを用いることにより、本発明の特徴の一つである架橋ポリマーの膨潤度、ゲル含量のコントロールが容易になるばかりでなく、架橋ポリマー内部に適度の架橋分布を与えるので良好な特性が得られやすくなる。アリル基を含有する架橋性モノマーとしてはアリルメタクリレート、トリアリルシアエレート、トリアリルイソシアネートが代表的なものであり、アリルメタクリレートが特に好ましい。さらにこれら以外のその他の架橋性モノマーとしてはエチレングリコールジメタクリレート等のアルキレングリコールの不飽和カルボン酸エステル；プロピレングリコールジアリルエーテル等のアルキレングリコールの不飽和アルコールエーテル；ジビニルベンゼン等の多価ビニルベンゼン等があげられる。架橋性モノマーの添加量は、前記非架橋性モノマーの合計量100重量部あたり0.5~5

重量部であり、特に10~40重量部であることが好ましい。

本発明のもう一つの特徴はある特定のゲル含有量および膨潤度を有する架橋ポリマーを拡散剤として用いるという事である。

下記に示す測定法で得られたゲル含有量の値が50~90重量%、好ましくは60~85重量%でかつ膨潤度が3~25、好ましくは7~20の架橋ポリマーを用いた場合にのみメタクリレート系重合体に対する優れた光拡散効果を与える。

ゲル含有量が50重量%未満の架橋ポリマーあるいは膨潤度が25を超える架橋ポリマーを用いた場合には十分な光拡散効果が得られないばかりか全体的にいくぶんヘイズになり光透過率も低下するので好ましくない。逆にゲル含有量が90重量%を超えるか、あるいは膨潤度が2未満の架橋ポリマーを用いた場合には成形体表面は荒れた感じになり、特殊な場合を除き照明カバー等の用途には向かないものになる。

(ゲル含有量・膨潤度の測定法)

所定量の架橋ポリマーを秤量ビンに秤量し、約100倍量のメチルエチルケトン(MEK)中に24時間浸漬する。浸漬後余分のMEKをデカンテーションにより十分に除去し、MEKで膨潤状態にある試料の重量を求める。次いで減圧乾燥によりMEKを乾燥除去し試料の絶乾重量を測定する。算出は次式に従う。

$$\text{ゲル含有量(重量\%)} = \frac{\text{絶乾重量(MEK浸漬後)}}{\text{採取試料重量}} \times 100$$

$$\text{膨潤度} = \frac{\text{MEK膨潤状態の試料重量} - \text{絶乾重量}}{\text{絶乾重量}}$$

架橋ポリマーのゲル含有量、膨潤度の調整は主に用いる架橋性モノマーの種類、量の調整および適量の連鎖移動剤の使用により行なわれる。連鎖移動剤としては炭素数3~20のアルキルメルカプタン、エステル系メルカプタン等通常用いられるものを用いることが出来る。

架橋ポリマーの懸濁重合は通常行なわれる方法で行なう事が出来、用いる開始剤、懸濁安定

水

230 重量部

かつた。

この架橋ポリマーを篩別し、その30メッシュ(500μ)通過分を実施例ノ-1)で得た架橋ポリマーのかわりに用いる他は、実施例ノ-1)と同様の手順で押出板を製造し、同様に評価した。

この成形板の全光線透過率は9.5%、価値は7.5であつたが表面は非常にザラザラした荒れた感じであり、照明カバー等には好ましくないものであつた。

参考例3

実施例ノ-1)で用いたのと同様の反応容器に次の化合物を仕込んだ

メチルメタクリレート	10 重量部
n-ブチルアクリレート	30 重量部
ステレン	10 重量部
アリルメタクリレート	1.5 重量部
ニードデシルメルカプタン	0.5 重量部
過硫酸カリウム	0.5 重量部

実施例2

実施例ノ-1)で用いたのと同じ反応容器に次の化合物を仕込み実施例ノ-1)と同様の手順で粒状の架橋ポリマーを得た。

メチルメタクリレート	35 重量部
ブチルメタクリレート	30 重量部
n-ブチルアクリレート	30 重量部
ステレン	5 重量部
アリルメタクリレート	1.5 重量部
ニ-オクチルメルカプタン	0.5 重量部
ラウロイルペーオキサイド	1.5 重量部
第三リン酸カルシウム	10 重量部
界面活性剤	0.01 重量部
水	200 重量部

得られたビーズ状架橋ポリマーの平均粒子径は約90μであり、ゲル含有量は7.7重量%、膨潤度は1.3であつた。

このビーズ状架橋ポリマーを実施例ノ-1)で製造した架橋ポリマーのかわりに用いる他は、実施例ノ-1)と同様の手順で押出板を製造し、

容器内を十分に窒素ガスで置換した後、上記化合物の混合物を攪拌しながら70℃まで昇温し、そのまま5時間保持して反応を完了させた。得られたラテックス中のポリマー粒子は約0.2μの粒子径を有していた(光透過法で測定)。このラテックスに5重量部の塩化カルシウムを添加して塩析し、さらに脱水・水洗・乾燥して粉末状の架橋ポリマーを得た。

この乳化重合により得られた架橋ポリマーを実施例ノ-1)で得た架橋ポリマーのかわりに用いる他は全く実施例ノ-1)と同様にして押出板を製造し同様に評価した。

この成形板は全光線透過率8.9%、価値10、60度観面光沢度10.7であり、光拡散効果が不十分で照明カバーとして不向きなものであつた。

同様の手順で評価した。

この押出板の全光線透過率は8.5%、価値は7.7、60度観面光沢度は2.9であり、表面状態も均一で極めて良好であつた。

参考例3

実施例ノ-1)で用いたのと同じ反応容器にアリルメタクリレートを除く実施例2で用いた化合物を仕込み、実施例ノ-1)と同様の手順で粒状の未架橋ポリマーを得た。

得られたビーズ状ポリマーの平均粒子径は約90μであり、ゲル含有量は0であつた。

この未架橋ポリマーを実施例ノ-1)で製造した架橋ポリマーのかわりに用いる他は実施例ノ-1)と同様の手順で押出板を製造し、同様の手順で評価した。

この成形板はやや曇った感じではあるが光拡散度は低く、また60度観面光沢度が11.5と高く、照明用カバー等の用途には不向きなものであつた。

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 59-038253

(43)Date of publication of application : 02.03.1984

(51)Int.Cl.

C08L 33/12
 //(C08L 33/12
 C08L 33/06)

(21)Application number : 57-148877

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(22)Date of filing : 27.08.1982

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(54) LIGHT-DIFFUSING ACRYLIC RESIN MOLDING

(57)Abstract:

PURPOSE: To provide a light-diffusing acrylic resin molding which has both high light diffusing ability and high light transmittance and does not cause lowering in the light diffusing ability even when fabricated, by blending a specified quantity of a specified crosslinked polymer with a methyl methacrylate polymer.

CONSTITUTION: A resin compsn. obtd. by blending 1W30pts.wt. crosslinked polymer with 100pts.wt. methyl methacrylate polymer is molded to obtain the titled molding. Said crosslinked polymer has a particle size of 10W500 μ , a gel content of 50W90wt% and a degree of swelling of 3W25 and can be obtd. by suspension- polymerizing 0.5W5pts.wt. crosslinkable monomer and 100pts.wt. non-crosslinkable monomer mixture consisting of 50W90wt% C1WC4 alkyl methacrylate, 10W40wt% C1WC8 alkyl acrylate, 0W20wt% arom. vinyl monomer and 0W 20wt% monoethylenically unsaturated monomer.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

FOR INFORMATION PURPOSES ONLY

(19) JAPANESE PATENT OFFICE (JP)

(12) LAID-OPEN PATENTS GAZETTE (A)

5 (11) Laid-open Patent Application No. 59-38253

(43) Laid open 2 March 1984)

(51) Int. Cl.³ Identification Code Patent Office File
Nos.

10 C 08 L 33/12 7142-4J

/(C 08 L 33/12

33/06)

7142-4J

Number of inventions : 1

15 Request for examination : None (Total 6 sheets)

(54) Light-diffusing acrylic resin molding

(21) Patent Application No. 57-148877

20 (22) Application date : 27 August 1982

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5 Light-diffusing acrylic resin molding

Light-diffusing acrylic resin molding which is
10 produced by molding a resin composition in which 1 - 30
parts by weight of the crosslinked polymer noted below
is blended with 100 parts by weight of a methyl
methacrylate polymer.

15 Crosslinked polymer with a particle diameter of 10
- 500 μ , a gel content of 50 - 90% by weight and a
swelling degree of 3 - 25 which is produced by
suspension polymerization of 0.5 - 5 parts by weight of
a crosslinkable monomer and 100 parts by weight of a
20 non-crosslinkable monomer consisting of

alkyl acrylate in which the number of carbon atoms
25 of the alkyl groups is 1 - 8
10 - 40% by weight

other monoethylenic unsaturated monomer 0 - 20% by
30 weight

The present invention relates to a light-diffusing acrylic resin molding which possesses an excellent light diffusion property and, at the same time, also has high light transmittance and which is suitable as a lighting cover, etc.

Conventionally, the usual method of imparting a light diffusion effect to acrylic resin moldings is to disperse fine particles of an inorganic compound such as barium sulfate, titanium oxide or talc, etc. in a base resin or to impart an irregular pattern by mechanical means such as effecting extrusion with a die which has a pattern of effecting passage through embossing rolls.

However, with a method using a die which has a pattern or embossing rolls, even if a molding which has a light diffusion effect to a certain degree is produced, there is the major drawback that when secondary processing to various shapes suitable for lighting covers, etc. is effected, the surface irregularities are lost, and so there is failure to produce a molding which displays a satisfactory light diffusion effect.

Also, in cases in which fine particles of an inorganic resin are added to a base resin, although a satisfactory light diffusion effect is generally achieved, there is the drawback that there is a considerable fall in the light transmittance, and there is drawback that the base resin's physical properties such as its impact strength, etc. deteriorate.

The present invention is one which makes improvement in respect of these drawbacks of conventional methods, and it has been achieved as the result of the discovery that a light-diffusing acrylic resin molding which combines an excellent light diffusion property and high light transmittance and whose light diffusion property does not deteriorate even if secondary processing is effected can be produced by making a specific admixture of a specific crosslinked polymer in a methyl methacrylate polymer.

The invention is a light-diffusing acrylic resin molding which is produced by molding a resin composition in which 1 - 30 parts by weight of the crosslinked polymer noted below is blended with 100 parts by weight of a methyl methacrylate polymer.

Crosslinked polymer :

Crosslinked polymer with a particle diameter of 10 - 500 μ , a gel content of 50 - 90% by weight and a swelling degree of 3 - 25 which is produced by suspension polymerization of 0.5 - 5 pts.wt. of a crosslinkable monomer and 100 pts.wt. of a non-crosslinkable monomer consisting of

alkyl methacrylate in which the number of carbon atoms of the alkyl groups is 1 - 4

50 - 90% by weight

alkyl acrylate in which the number of carbon atoms of the alkyl groups is 1 - 8

10 - 40 wt%

aromatic vinyl monomer 0 - 20 wt%

other monoethylenic unsaturated monomer 0 - 20 wt%

The invention is characterized by the fact that a crosslinked polymer with a specific composition, particle diameter, gel content and swelling degree is admixed as the light diffusion agent of a methyl methacrylate polymer. As a result of this, the invention provides a light-diffusing acrylic resin molding possessing an excellent performance which has never been achieved in cases in which conventional inorganic light diffusion agents are admixed.

One special feature of the invention is constituted by the method of manufacture of the crosslinked polymer which is used as a light diffusion agent and the prescription of the particle diameter that is produced. More specifically. The crosslinked polymer which is used is one whose particle diameter which has been produced by suspension polymerization is 10-500 μ , preferably 35-200 μ . With a crosslinked

polymer whose particle diameter exceeds 500 μ , even if its composition, gel content and swelling degree are within the ranges which are prescribed in the invention, and molding is effected after it is added to a methyl methacrylate polymer, the surface of the resulting molding feels rough, and the molding is undesirable as material for a lighting cover, etc. On the other hand a satisfactory light diffusion effect is not achieved by a crosslinked polymer whose particle diameter is less than 10 μ , especially one with a particle diameter of 1 μ or less which is produced by emulsification polymerization.

Appropriate composition regions also exist for the monomers which constitute the crosslinked polymer which is used in the invention and, with compositions outside these regions, the light diffusion effect is unsatisfactory, or the light transmittance is unsatisfactory, or the only moldings produced by blending these compositions and effecting molding are ones whose surface feels rough.

A monomer composition which is suitable for constituting the crosslinked polymer which is used in the invention is a composition consisting of 50-90 wt% of an alkyl methacrylate in which the number of carbon atoms of the alkyl groups is 1-4, 10-40 wt% of an alkyl acrylate in which the number of carbon atoms of the alkyl groups is 1-8, 0-20 wt% of an aromatic vinyl monomer, 0-20 wt% of another monoethylenic unsaturated monomer, and 0.5 - 5 pts.wt. of a crosslinkable monomer per 100 pts.wt. of the combined total of non-crosslinkable monomers.

Methyl methacrylate, ethyl methacrylate, propyl methacrylate and butyl methacrylate, etc. can be used alone or mixed as the alkyl methacrylate in which the number of carbon atoms of the alkyl groups is 1-4, and methyl methacrylate is particularly preferable. The

amount of the alkyl methacrylate used is 50-90 wt%, preferably 55-90 wt%.

Methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, or 2-ethyl-hexyl acrylate, etc. can be used alone or mixed as the alkyl acrylate in which the number of carbon atoms of the alkyl groups is 1-8, and substances such as butyl acrylate and 2-ethyl-hexyl acrylate, etc. whose glass transition temperature is low are the more preferable. The amount of the alkyl acrylate used is 10-40 wt%, preferably 25-40 wt%.

It is possible to use styrene, α -methylstyrene, vinylstyrene or halogenated styrene, etc. as the aromatic vinyl monomer, and the amount thereof used is 0-20 wt%, preferably 3-15 wt%. The use of more than 20 wt% of an aromatic vinyl monomer is undesirable, since it causes deterioration of the light transmittance, etc. From the point of view of adjustment of the refractive index and control of the degree of crosslinking, etc. of the crosslinked polymer, it is found in most cases that it is better to use an amount not exceeding 20 wt%.

It is not particularly necessary to use another monoethylenic unsaturated monomer, but it is possible to use one in an amount not exceeding 20 wt%. By way of specific examples, it is possible to use fumaric acid, maleic acid, copolymerizable carboxylic acid and esters thereof, acrylic acid, methacrylic acid, acrylonitrile, halogenated vinyl and vinyl esters, etc.

A compound which has 2 or more unsaturated bonds in its molecules can be used as the crosslinkable monomer, and it is particularly preferable that it be a compound in which at least 1 within the 2 or more unsaturated bonds is an allyl group. The use of such a crosslinkable monomer which contains allyl groups makes it easy to achieve good characteristics, since, as well

as making the control of the swelling degree and the gel content of the crosslinked polymer easy, it gives a suitable crosslinking distribution in the crosslinked polymer. By way of crosslinkable monomers, which contain allyl groups, there are, as typical substances, allyl methacrylate, triallyl cyanurate and triallyl isocyanate, allyl methacrylate being particularly preferable. By way of other crosslinkable monomers apart from these, it is possible to cite alkylene glycol unsaturated carboxylic acid esters such as ethylene glycol dimethacrylate, etc.; alkylene glycol unsaturated alcohol ethers such as propylene glycol diallyl ether, etc.; and polyvalent vinyl benzenes such as divinyl benzene, etc. The amount of crosslinkable monomer added is 0.5 - 5 pts.wt. per 100 pts.wt. of the combined total of the non-crosslinkable monomers noted above, 1.0 - 4 pts.wt. being particularly preferable.

Another special feature of the invention is that a crosslinked polymer which has a specific gel content and swelling degree is used as a diffusion agent.

An excellent light diffusion effect is imparted to the methyl methacrylate polymer only when a crosslinked polymer whose gel content found by the measurement method described below is 50-90 wt%, preferably 60-85 wt%, and whose degree of swelling is 3-25, preferably 7-20.

If a crosslinked polymer whose gel content is less than 50 wt% or a crosslinked polymer whose degree of swelling exceeds 25 is used, this is undesirable, since a satisfactory light diffusion effect fails to be achieved and, in addition, the material becomes rather hazy overall and the light transmittance deteriorates. Conversely, if a crosslinked polymer whose gel content exceeds 90% or whose degree of swelling is less than 3 is used, the molding has a surface which feels rough

and, except in special cases, it is not suited to applications such as that of a lighting cover, etc.

Methods of measurement of gel content and degree
5 of swelling:

A set amount of crosslinked polymer is weighed in a weighing bottle and is immersed for 48 hours in an amount of methyl ethyl ketone (MEK) that is about 100 times greater. After the immersion, thorough removal
10 of excess MEK is effected by decantation, the weight of the sample which has been brought to a swollen state by the MEK is determined, and then the MEK is dried and removed by vacuum drying and the absolute dry weight of the sample is measured. Calculations by the following
15 formulas are made.

$$\text{Gel content (wt\%)} = \frac{\text{Absolute dry weight (after MEK immersion)}}{\text{Weight of sample that is taken}} \times 100$$

20 Degree of swelling

$$\frac{\text{Weight of sample in MEK swelling state} - \text{absolute dry weight}}{\text{Absolute dry weight}}$$

Adjustment of the gel content and the degree of swelling of the crosslinked polymer is mainly effected
25 through the adjustment of the type and the amount of the crosslinkable monomer that is used and the use of a suitable amount of a chain shift agent. Normally employed substances such as a 2-20C alkyl mercaptan or an ester-based mercaptan can be used as a chain shift
30 agent.

Suspension polymerization of the crosslinked polymer can be effected by normally employed procedure and, although there are no particular restrictions
35 regarding the initiator and suspension stabilizer which are used, it is necessary to take care over the used amounts, etc., in order to avoid departure from the

preferred ranges for characteristics such as the particle diameter and the gel content, etc.

5 What is meant by a methyl methacrylate polymer in the invention, is a methyl methacrylate homopolymer or a copolymer of methyl methacrylate and another monomer, eg, methyl acrylate, ethyl acrylate, n-butyl acrylate or ethyl methacrylate, etc. in which the methyl methacrylate component is 85% or more.

10

 The amount of crosslinked polymer system diffusion agent used in the invention is 1-30 pts.wt., preferably 5-15 pts.wt. relative to 100 pts.wt. of the methyl methacrylate polymer.

15

 The methyl methacrylate polymer and the crosslinked polymer system light diffusion agent can be mixed by normally employed procedure such as the use of a Henschel mixer, etc.

20

 The mixture of the methyl methacrylate polymer and the crosslinked polymer system light diffusion agent can be made a molding by the same procedure as that for ordinary methyl methacrylate polymers, i.e. extrusion or injection molding procedure.

25

 There is no objection if, within the range in which the object of the invention is achieved, small amounts of a dye pigment, a bluing agent, a fluorescent whitener, a heat stabilizer or other additives are added for the purpose of increasing the product value.

30

 The molding which is produced in this manner combines an excellent light diffusion effect and high light transmittance, and is very suitable as material for lighting covers, etc.

35

 Below, a description in further detail is given by means of examples of implementation, though the

invention is not limited to these examples of implementation.

Example 1

5

(1) Manufacture of crosslinked polymer

The following compounds were charged into a reaction vessel provided with a stirrer, a reflux cooler and a nitrogen gas introduction port, etc.

Methyl methacrylate	60 pts.wt.	
n-butyl acrylate	30 pts.wt.	
styrene	10 pts.wt.	→ 40
15 allyl methacrylate	1.5 pts.wt.	
t-dodecyl methacrylate	0.3 pts.wt.	
azobisisobutyronitrile	0.5 pts.wt.	←
polyvinyl alcohol	1.0 pt.wt.	
water	200 pts.wt.	

20

After the interior of the vessel had been thoroughly replaced by nitrogen gas, the mixture of the compounds noted above was heated to 70°C while being stirred, and polymerization was caused to proceed in the nitrogen gas. After 4 hours, the temperature was raised to 90°C, and polymerization was completed by holding at 90°C for 1 hour. After the completion of polymerization, dewatering, water-washing and drying were effected, and granular beads were obtained.

30

The average particle diameter of the beads that were obtained was 120 μ , the gel content was 75 wt% and the swelling degree was 11.

35 (2) Manufacture of acrylic resin molding

10 pts.wt. of the crosslinked polymer obtained in (1) was added to 100 pts.wt. wt. of a methyl methacrylate polymer (Acrylpet MDK manufactured by

Mitsubishi Rayon KK) and thoroughly mixed therewith by means of a Henschel mixer, and then pellets were produced by means of an extrusion machine.

5 The pellets that were produced were dried for 24 hours at 80°C, and then a 2.5 mm thick sheet was molded by extruding the pellets 220°C by means of the same extrusion machine.

10 The total light transmittance and the haze value of the molded sheet that was produced were measured by an integrating bulb type haze meter, its 60-degree specular gloss was measured by a digital variable-angle gloss meter (manufactured by Suga Shikenki), and then
15 state of the molding's surface was judged visually.

 The total light transmittance of this molding was 85%, its haze value was 79 and its 60 degree specular gloss was 23. Also, it was an excellent product whose
20 surface was uniform and without any impression of roughness.

Reference Example 1

25 A crosslinked polymer was produced in the same way as in Example 1 (1) except that the amount of polyvinyl alcohol was made 0.3 pts.wt. The gel content and the swelling degree of the crosslinked polymer that was produced were about the same as in Example 1 (1), but,
30 at 600 μ , its average particle diameter was considerably greater.

 This crosslinked polymer was screened, an extruded sheet was manufactured by the same procedure as in
35 Example 1 (2) except that the 32 mesh (500 μ) pass fraction of this polymer was used instead of the crosslinked polymer that was produced in Example 1 (1), and evaluations were made in the same way.

The total light transmittance of this molding was 92% and its haze value was 76, but its surface had an extremely gritty rough feel, and it was undesirable as a molding for lighting covers, etc.

5

Reference Example 2

The following compounds were charged into a reaction vessel like that used in Example 1 (1).

10

Methyl methacrylate	60 pts.wt.	←
n-butyl acrylate	30 pts.wt.	
styrene	10 pts.wt.	→
allyl methacrylate	1.5 pts.wt.	
15 t-dodecyl mercaptan	0.3 pts.wt.	
potassium persulfate	0.3 pts.wt.	
sulfosuccinic acid ester		
sodium salt	1.5 pts.wt.	
20 water	250 pts.wt.	

20

After the interior of the vessel had been thoroughly replaced by nitrogen gas, the mixture of the compounds noted above was heated to 70°C while being stirred, and was held as it was for 5 hours to complete polymerization. The polymer particles in the latex that was produced had a particle diameter of approximately 0.2 μ (measurement by light transmission method). Salting out was effected by adding 5 pts.wt. of calcium chloride to this latex, and a crosslinked polymer in powder form was obtained by further effecting dewatering, water-washing and drying.

25

30

An extruded sheet was manufactured by exactly the same procedure as in Example 1 (2) except that this crosslinked polymer which had been produced by emulsification polymerization was used instead of the crosslinked polymer that was produced in Example 1 (1), and evaluations were made in the same way.

35

The total light transmittance of this molded sheet was 89%, its haze value was 1.0, its specular gloss was 107, and as its light diffusion effect was unsatisfactory, it was not suitable as a lighting
5 cover.

Example 2

The following compounds were charged into a
10 reaction vessel which was the same as that used in Example 1 (1), and a crosslinked polymer was produced by the same procedure as in Example 1 (1).

	Methyl methacrylate	35 pts.wt.
15	butyl methacrylate	30 pts.wt.
	n-butyl acrylate	30 pts.wt.
	styrene	5 pts.wt.
	allyl methacrylate	1.5 pts.wt.
	n-octyl mercaptan	0.3 pts.wt.
20	lauroyl peroxide	1.5 pts.wt.
	tribasic calcium phosphate	1.0 pt.wt.
	surfactant	0.01 pts.wt.
	water	200 pts.wt.

25 The average particle diameter of the crosslinked polymer that was obtained in the form of beads was approximately 90 μ , its gel content was 77 wt%, and its swelling degree was 13.

30 An extruded sheet was manufactured by the same procedure as in Example 1 (2) except that this crosslinked polymer in the form of beads was used instead of the crosslinked polymer that was manufactured in Example 1 (1), and evaluations were
35 made in the same way.

The total light transmittance of this extruded sheet was 85%, its haze value was 77, its 60-degree

specular gloss was 29, and its surface was uniform and extremely good.

Reference Example 3

5

The compounds that were used in Example 2 apart from allyl methacrylate were charged into a reaction vessel which was the same as that used in Example 1 (1), and an uncrosslinked polymer in the form of a powder was produced by the same procedure as in Example 1 (1).

15 The average particle diameter of the crosslinked polymer that was obtained in the form of beads was approximately 90 μ and its gel content was 0.

20 An extruded sheet was manufactured by the same procedure as in Example 1 (2) except that this uncrosslinked polymer which had been produced was used instead of the crosslinked polymer that was manufactured in Example 1 (1), and evaluations were made in the same way.

25 This molded sheet had a slightly ... (illegible) feel, the degree of its light diffusion was low, its 60-degree specular gloss, at 115, was high, and it was unsuitable for applications such as those of lighting covers, etc.

30 Reference Example 4

Compounds which were the same as in Example 2 except that 7 pts.wt. of allyl methacrylate was used were charged into a reaction vessel which was the same as that used in Example 1 (1), and a crosslinked polymer in granular form was produced by the same procedure as in Example 1 (1).

The average particle diameter of the crosslinked polymer that was obtained in the form of beads was approximately 90 μ , its gel content was 96 wt%, and its swelling degree was 29.

5

An extruded sheet was manufactured by the same procedure as in Example 1 (2) except that this crosslinked polymer which had been produced was used instead of the crosslinked polymer that was manufactured in Example 1 (1), and evaluations were made in the same way.

15 This molded sheet had a rough and gritty surface, and it was unsuitable for applications such as those of lighting covers, etc.

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